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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,145	02/17/2004	Keith Myers	0555.001	9686

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EXAMINER	
MURALIDAR, RICHARD V	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 02/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/780,145	MYERS, KEITH	
	Examiner	Art Unit	
	Richard V. Muralidar	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/17/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/17/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> [b] The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 9, 11-14, 16, and 22-23 are rejected under 35 U.S.C. 102[b] as being anticipated by Pollock [US 6384564].

With respect to Claims 1 and 11, Pollock discloses a capacitor discharge system [Fig.13], comprising: a first capacitor [Fig. 13 capacitor 35]; a second capacitor [Fig. 13 capacitor 36]; a first inductor [Fig.13 inductor 23]; a second inductor [Fig. 13 inductor 22]; a discharge switching device [switching control circuit col. 3 lines 18-20]; and a charging device [Fig. 13 the power supply for the positive and negative rail]; wherein said charging device places a first electric charge on said first capacitor during a first charging cycle, said discharge switching device creates a first electrical path from said first capacitor to said second capacitor through said first inductor during a first discharge cycle, said charging device places a second electric charge on said second capacitor during a second charging cycle, and said discharge switching device creates a second electrical path from said second capacitor to said first capacitor through said second inductor during a second discharge cycle [col. 2 lines 66-67 and col. 3 lines 1-15].

With respect to Claims 2 and 12, Pollock discloses a motor shaft that interacts

with a magnetic field generated by a flow of electric current through said first inductor during said first discharge cycle and said second inductor during said second discharge cycle to produce a rotating motion of said motor shaft [Abstract; Fig. 13; col. 1 lines 27-38].

With respect to Claims 3 and 13, Pollock discloses that said first inductor and said second inductor are electric motor phase windings [Fig. 13 field windings 22 and 23].

With respect to Claims 4 and 14, Pollock discloses a capacitor drain circuit for removing a first residual electric charge from said second capacitor during said first charging cycle and for removing a second residual charge from said first capacitor during said second charging cycle [col. 4 lines 56-67 and col. 5 lines 1-7; the circuit is at resonance and is therefore cyclically adding residual charge between the capacitors and the inductors once every half cycle then removing the charge during the other half cycle].

With respect to Claim 6, Pollock discloses a shaft position sensor; a switch control circuit; and magnetic material mounted on said motor shaft; whereby said shaft position sensor detects movement of said magnetic material corresponding to said rotating motion of said motor shaft, said shaft position sensor transmits a signal to said switch control circuit, and said switch control circuit controls said charging device and said capacitor drain circuit [col. 1 lines 27-38]. Another example of rotor shaft sensing can be found in Harris US 5075610 [Fig. 1; col. 1 lines 25-29].

With respect to Claims 9 and 16, Pollock discloses said discharge switching device is a solid-state switching device [Fig. 9 switching means 31-32].

With respect to Claim 22, Pollock discloses a method of creating an alternating magnetic field in a motor [col. 4 lines 26-31] comprising the steps of: placing a first electric charge on a first capacitor [Fig. 13 Capacitor 35]; creating a first electrical path between said first capacitor and a second capacitor [Fig. 13 Capacitor 36] through a first inductor [Fig. 13 inductor 23]; placing a second electric charge on said second capacitor; and creating a second electrical path between said second capacitor and said first capacitor through a second inductor [Fig. 13 inductor 22].

With respect to Claim 23, Pollock discloses removing a first residual charge from said second capacitor during said step of placing a first electric charge on said first capacitor; and removing a second residual charge from said first capacitor during said step of placing a second electric charge on said second capacitor [this is an explanation of resonance theory and is explained in col. 2 lines 66-67 and col. 3 lines 1-15].

Claims 20-21 are rejected under 35 U.S.C. 102[b] as being anticipated by Peng [US 6111770].

With respect to Claim 20, Peng discloses a method of creating an alternating magnetic field in an inductor [Fig. 4d inductor Lr] comprising the steps of: placing a first electric charge on a first capacitor [Fig. 4d capacitor Cr2]; creating a first electrical path between said first capacitor and a second capacitor [Fig. 4d capacitor Ct1] through an inductor; placing a second electric charge on said second capacitor; and creating a second electrical path between said second capacitor and said first capacitor through

said inductor [this is an explanation of resonance theory and is described in col. 2 lines 34-46].

With respect to Claim 21, Peng discloses removing a first residual charge from said second capacitor during said step of placing a first electric charge on said first capacitor; and removing a second residual charge from said first capacitor during said step of placing a second electric charge on said second capacitor [this is an explanation of resonance theory and is described in Col. 1 lines 26-29].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103[a] which forms the basis for all obviousness rejections set forth in this Office action:

> [a] A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 15 are rejected under 35 U.S.C. 103[a] as being unpatentable over Pollock [US 6384564 in view of Harris [US 5075610].

With respect to Claims 5 and 15, Harris discloses a shaft position sensor [Fig. 1 rotor position sensor 76]; a switch control circuit [Fig. 1 controller 74]; and magnetic material mounted on said motor shaft [col. 9 lines 32-37]; whereby said shaft position sensor detects movement of said magnetic material corresponding to said rotating motion of said motor shaft, said shaft position sensor transmits a signal to said switch control circuit, and said switch control circuit directs the activity of said charging device

and said capacitor drain circuit [col. 7 lines 66-69 and col. 8 lines 1-64]. Pollock mentions the shaft position sensor etc. in [col. 1 lines 27-38], but only in passing. Harris elaborates on each item.

Pollock and Harris are analogous methods of controlling electrical motors. At the time of the invention, it would have been obvious to one of ordinary skill in the art to explicitly add the shaft position sensor with switch control circuit to Pollock for the benefit of further elucidating the principle of operation of the switched reluctance motor (SRM); specifically, how each winding is alternately energized and de-energized with respect to rotor shaft position in order to produce shaft rotation.

Claims 7-8 are rejected under 35 U.S.C. 103[a] as being unpatentable over Pollock [US 6384564 in view of White [US 2561897].

With respect to Claim 7, White discloses a capacitor discharge system wherein said discharge switching device is a mechanical switch [Fig. 1 rotary switch 4]. Pollock does not teach a mechanical switch.

With respect to Claim 8, White discloses said motor shaft includes a motor shaft gear, said mechanical switch includes a switch gear, and said switch gear is driven by said motor shaft gear during said rotating motion of said motor shaft to produce a rotating motion of said mechanical switch [col. 2 lines 41-43. Pollock does not teach a mechanical switch or means to actuate one. Examiner notes that this is an obsolete means of determining rotor position in today's switched reluctance motors. More conventional means in this field involves sensor-less methods that determine the current flow in the field windings, then uses this information to extrapolate the rotor's

exact position [Harris US 5075610 col. 1 lines 54-63]. However, if one desires a mechanical means of determining rotor position, one of ordinary skill in the art can very easily set up the appropriate configuration of gears and rotating contacts on the motor shaft to accomplish this].

At the time of the invention, it would have been obvious to one skilled in the art to modify Pollock with a mechanical means of sensing rotor position for the benefit of backwards compatibility with older SRM's that use mechanical rotor sensors.

Claims 10 and 19 are rejected under 35 U.S.C. 103[a] as being unpatentable over Pollock [US 6384564 in view of Ehsani [US 5852358].

With respect to Claims 10, Ehsani discloses said solid-state switching device comprises a plurality of silicon-controlled rectifiers [Fig. 3 Switches 102, 104, 106, 108, 110, 112]. Pollock discloses solid-state switches, but not specifically silicon-controlled rectifiers.

With respect to Claims 19, Ehsani discloses said plurality of silicon-controlled rectifiers is controlled by said switch-control circuit [Fig. 1 trigger signal generator 42; col. 2 lines 23-27]. Pollock does not disclose that SCR's are controlled by the switch-control circuit.

Pollock and Ehsani are analogous motor control circuits. At the time of the invention, it would have been obvious to one of ordinary skill in the art to specify SCR's as the controlled solid state switches for the benefit of having the most widely used low cost solid-state switches in use today.

Claims 17-18 are rejected under 35 U.S.C. 103[a] as being unpatentable over Pollock [US 6384564 in view of Harris [US 5075610] in further view of Ehsani [US 5852358].

With respect to Claim 17, Ehsani discloses said solid-state switching device comprises a plurality of silicon-controlled rectifiers [Fig. 3 Switches 102, 104, 106, 108, 110, 112]. Pollock and Harris disclose solid-state switches, but not specifically silicon-controlled rectifiers.

With respect to Claim 18, Ehsani discloses said plurality of silicon-controlled rectifiers is controlled by said switch-control circuit [Fig. 1 trigger signal generator 42; col. 2 lines 23-27]. Pollock and Harris do not disclose that SCR's are controlled by the switch-control circuit.

Pollock, Harris, and Ehsani are analogous motor control circuits. At the time of the invention, it would have been obvious to one of ordinary skill in the art to add SCR's to the motor controller as the solid-state switches for the benefit of having the most widely used low cost solid-state switches in use today.

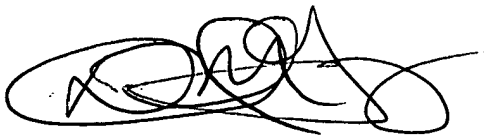
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pelonis [US-6664750], Makaran [2001/0000293], and Limpaecher [5986907] are cited for the disclosure of various regenerative means of controlling motors and reusing excess energy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on Monday to Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Gray can be reached on Monday to Friday 8-5. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RVM
01/30/2006

David Gray
Primary Examiner